AMENDMENTS TO THE CLAIMS

The following Listing of Claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A method of forming and detecting a mark on a substrate comprising:

applying a marking material comprising an infrared reflective inorganic pigment to the substrate to form a mark ~~that reflects or absorbs~~, wherein the infrared reflective inorganic pigment causes the mark to reflect radiation at a predetermined wavelength within the range of from about 0.75 μm to about 40 μm at a sufficiently different level than the substrate adjacent to the mark such that the mark can be discerned from the substrate at the predetermined wavelength;

applying a cover coating material comprising an inorganic pigment that is different than the infrared reflective inorganic pigment in the marking material over the mark and over at least a portion of the substrate adjacent to the mark to form a cover coat ~~that~~, wherein the cover coat appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals the mark covered by the cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength such that the mark can be discerned from the substrate through the cover coat at the predetermined wavelength; and

detecting the mark applied to the substrate through the cover coat at the predetermined wavelength using an infrared detecting device.

Claim 2 (original): The method according to claim 1 wherein the substrate is a surface of a part for installation in a land vehicle or aircraft.

Claim 3 (original): The method according to claim 1 wherein the substrate is a primer coat layer applied to a surface of an article.

Claim 4 (canceled)

Claim 5 (currently amended): The method according to claim ~~4~~ 1 wherein the infrared reflective inorganic pigment is one or more selected from the group consisting of:

$Mn_2V_2O_7$;

$M1_xMnO_y$, where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to X+1 and less than or equal to X+2 and designates the number of oxygen atoms required to maintain electroneutrality;

$Bi_2Mn_4O_{10}$; ~~and~~

solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and

solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc.

Claim 6 (original): The method according to claim 1 wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 μm to about 15 μm.

Claim 7 (original): The method according to claim 1 wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 μm to about 0.5 μm.

Claim 8 (original): The method according to claim 1 wherein the substrate is selected from the group consisting of metal, glass, wood, paper, plastic and ceramic.

Claim 9 (original): The method according to claim 1 wherein the marking material is selected from the group consisting of paint, enamel, laser marking composition, glass, ink, putties and fillers, chemical etchants and transfer films.

Claim 10 (original): The method according to claim 1 wherein the cover coating material is selected from the group consisting of paint, glass, enamel, ink, and transfer films.

Claim 11 (original): The method according to claim 1 wherein the mark is in the form of a machine-readable code.

Claim 12 (original): The method according to claim 1 wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve.

Claim 13 (original): The method according to claim 1 wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve.

Claim 14 (currently amended): A method of forming a durable infrared detectable mark on a substrate comprising:

applying a marking material comprising an infrared reflective inorganic pigment to the substrate to form a mark;

applying a contrast marking material to the substrate to form a contrast mark proximal to the mark, wherein the infrared reflective inorganic pigment causes the mark ~~reflects or absorbs~~ to reflect radiation at a predetermined wavelength within the range of from about 0.75 μm to about 40 μm at a sufficiently different level than the contrast mark such that the mark can be discerned from the contrast mark at the predetermined wavelength; and

applying a cover coating material comprising an inorganic pigment that is different than the infrared reflective inorganic pigment in the marking material over the mark and the contrast mark to form a cover coat ~~that~~, wherein the cover coat appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals both the mark and the contrast mark covered by the cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength such that the mark can be discerned from the contrast mark through the cover coat at the predetermined wavelength.

Claim 15 (original): The method according to claim 14 wherein the substrate is a surface of an article.

Claim 16 (original): The method according to claim 14 wherein the substrate is a base coat layer applied to a surface of an article.

Claim 17 (canceled)

Claim 18 (currently amended): The method according to claim ~~17~~ 14 wherein the infrared reflective inorganic pigment is one or more selected from the group consisting of:

$Mn_2V_2O_7$;

$M1_xMnO_y$, where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to X+1 and less than or equal to X+2 and designates the number of oxygen atoms required to maintain electroneutrality;

$Bi_2Mn_4O_{10}$; ~~and~~

solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and

solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc.

Claim 19 (original): The method according to claim 14 wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 µm to about 15 µm.

Claim 20 (original): The method according to claim 14 wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 µm to about 0.5 µm.

Claim 21 (original): The method according to claim 14 wherein the substrate is selected from the group consisting of metal, glass, wood, plastic and ceramic.

Claim 22 (original): The method according to claim 14 wherein the marking material is selected from the group consisting of paint, enamel, laser marking composition, glass, ink, and transfer films.

Claim 23 (original): The method according to claim 14 wherein the cover coating material is selected from the group consisting of paint, glass, enamel, ink, and transfer films.

Claim 24 (original): The method according to claim 14 wherein the mark is in the form of a bar code.

Claim 25 (original): The method according to claim 14 wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve.

Claim 26 (original): The method according to claim 14 wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve.

Claim 27 (currently amended): The method according to claim 14 wherein the contrast marking material comprises an infrared reflective inorganic pigment that is different from the infrared reflective organic pigment in the marketing material.

Claim 28 (currently amended): The method according to claim 27 wherein the infrared reflective inorganic pigment in the contrast marking material is one or more selected from the group consisting of:

$Mn_2V_2O_7$;

$M1_xMnO_y$, where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than

or equal to X+1 and less than or equal to X+2 and designates the number of oxygen atoms required to maintain electroneutrality;

$Bi_2Mn_4O_{10}$; ~~and~~

solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and

solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc.

Claim 29 (currently amended): A method of forming a durable infrared detectable mark on a substrate comprising:

applying a marking material comprising an infrared reflective inorganic pigment to the substrate to form a mark;

applying a masking material over a least a portion of the mark and, optionally, over a portion of the substrate, to form a mask, wherein the infrared reflective inorganic pigment causes the mark ~~reflects or absorbs~~ to reflect radiation at a predetermined wavelength within the range of from about 0.75 µm to about 40 µm at a sufficiently different level than the mask such that the mark can be discerned from the mask at the predetermined wavelength; and

applying a cover coating material comprising an inorganic pigment that is different than the infrared reflective inorganic pigment in the marking material over the mark and the mask to form a cover coat ~~that~~, wherein the cover coat appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals both the mark and the

mask covered by the cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength such that the mark can be discerned from the mask through the cover coat at the predetermined wavelength.

Claim 30 (original): The method according to claim 29 wherein the substrate is a surface of an article.

Claim 31 (original): The method according to claim 29 wherein the substrate is a base coat layer applied to a surface of an article.

Claim 32 (canceled)

Claim 33 (currently amended): The method according to claim 32 wherein the infrared reflective inorganic pigment is one or more selected from the group consisting of:

$Mn_2V_2O_7$;

$M1_xMnO_y$, where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to X+1 and less than or equal to X+2 and designates the number of oxygen atoms required to maintain electroneutrality;

$Bi_2Mn_4O_{10}$; ~~and~~

solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and

solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from

aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc.

Claim 34 (original): The method according to claim 29 wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.02 µm to about 15 µm.

Claim 35 (original): The method according to claim 29 wherein the average particle size of the inorganic pigment in the cover coating material is from about 0.1 µm to about 0.5 µm.

Claim 36 (original): The method according to claim 29 wherein the substrate is selected from the group consisting of metal, glass, wood, plastic and ceramic.

Claim 37 (original): The method according to claim 29 wherein the marking material is selected from the group consisting of paint, enamel, laser marking composition, glass, ink, and transfer films.

Claim 38 (original): The method according to claim 29 wherein the cover coating material is selected from the group consisting of paint, glass, enamel, ink, and transfer films.

Claim 39 (original): The method according to claim 29 wherein the mark is in the form of a bar code.

Claim 40 (original): The method according to claim 29 wherein the inorganic pigment in the cover coating material is doped with one or more elements such that the inorganic pigment provides a uniquely identifiable spectral curve.

Claim 41 (original): The method according to claim 29 wherein the cover coating material comprises two or more different inorganic pigments that together provide a uniquely identifiable spectral curve.

Claim 42 (currently amended): The method according to claim 29 wherein the masking material comprises an infrared reflective inorganic pigment that is different than the infrared reflective inorganic pigment in the marking material.

Claim 43 (currently amended): The method according to claim 42 wherein the infrared reflective inorganic pigment in the masking material is one or more selected from the group consisting of:

$Mn_2V_2O_7$;

$M1_xMnO_y$, where M1 is calcium, strontium, barium, magnesium, yttrium and/or an element selected from the Lanthanide series of the Periodic Table of the Elements, x is a number from about 0.01 to about 99, and y is greater than or equal to X+1 and less than or equal to X+2 and designates the number of oxygen atoms required to maintain electroneutrality;

$Bi_2Mn_4O_{10}$; ~~and~~

solid solutions having a corundum-hematite crystalline structure comprising iron oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, chrome, cobalt, gallium, indium, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc; and

solid solutions having a corundum-hematite crystalline structure comprising chrome oxide a host component doped with guest elements selected from aluminum, antimony, bismuth, boron, cobalt, gallium, indium, iron, lanthanum, lithium, magnesium, manganese, molybdenum, neodymium, nickel, niobium, silicon, tin, titanium, vanadium and zinc.

Claim 44 (currently amended): A ~~multilayer coating~~ non-visible authentication mark comprising a ~~marking layer~~ mark disposed between a substrate and a cover

coating layer that covers the mark and at least a portion of the substrate surrounding the mark, wherein the mark comprises an infrared reflective inorganic pigment and the cover coating layer comprises an inorganic pigment that is different than the infrared reflective inorganic pigment in the mark, wherein the ~~marking layer reflects or absorbs~~ infrared reflective inorganic pigment in the mark causes the mark to reflect radiation at a predetermined wavelength within the range of from about 0.75 μm to about 40 μm at a sufficiently different level than the substrate covered by the cover coating layer, and wherein the cover coating layer appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals the mark covered by the cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength that the mark can be discerned from the substrate through the cover ~~coat~~ coating layer at the predetermined wavelength.

Claim 45 (currently amended): An article marked with a non-visible authentication mark comprising a ~~marking layer~~ mark disposed between a surface of the article and a cover coating layer that covers the mark and at least a portion of the substrate surrounding the mark, wherein the mark comprises an infrared reflective inorganic pigment and the cover coating layer comprises an inorganic pigment that is different than the infrared reflective inorganic pigment in the mark, wherein the ~~marking layer reflects or absorbs~~ infrared reflective inorganic pigment in the mark causes the mark to reflect radiation at a predetermined wavelength within the range of from about 0.75 μm to about 40 μm at a sufficiently different level than ~~an area~~ the surface of the article beneath the cover coating adjacent to the ~~marking layer~~ mark, and wherein the cover coating layer appears substantially opaque in the visible portion of the electromagnetic spectrum such that it conceals the mark covered by the cover coat in the visible portion of the electromagnetic spectrum but is sufficiently transmissive of radiation emitted at the predetermined wavelength that the mark can be discerned from the ~~area~~ surface of the article beneath the cover coating adjacent to the marking layer through the cover ~~coat~~ coating layer at the predetermined wavelength.